

CALL FOR PAPERS

IMPORTANT DATES

Submission Deadlines

April 1, 2023

Abstract Submission

April 15, 2023

Acceptance notification to Authors

July 2, 2023

Final Paper Submission

Conference Dates

October 1–2, 2023

Tutorial Dates

October 3–5, 2023

Plenaries and Sessions

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Join us in Barcelona, Spain for the 42nd AIAA/IEEE Digital Avionics Systems Conference (DASC), the preeminent R&D conference in the field of digital avionics offered by two distinguished professional societies, the American Institute of Aeronautics and Astronautics (AIAA) and the Institute of Electrical and Electronics Engineers (IEEE). Continuing its rich tradition of incorporating attendees from diverse backgrounds to discuss relevant technical topics, the conference continues to provide an environment that includes educational and recreational opportunities. We welcome everyone to join us at the 42nd DASC.

CONFERENCE THEME:

CONNECTED AIRCRAFT IN AN EVOLVING AVIATION ECOSYSTEM

The digital transformation of the air transportation system is part of the foundation of a new era of aviation that has emerged early in the second century of flight. A hallmark of this transformation is digital communications connecting aircraft, air traffic control systems, and flight operations centers, and the new era will bring widespread urban air mobility, autonomous flight, long endurance high-altitude aircraft, regular transits of spacecraft, and net-zero climate impact of commercial transport, each of these enabled in an important way by aircraft being highly connected to the rapidly evolving airspace system in which they are operating. The 42nd DASC will explore the digital systems that use aircraft connectivity to improve flight operational efficiency and safety and to enable safe and affordable integration into the airspace by the diverse new types of air vehicles. Conference participants are invited to submit cutting edge research papers and exchange diverse perspectives on how the industry currently is or how it should be realizing the vision for the new era of aviation. Original research on technical challenges, gaps, and approaches to enhance traditional ATM, UAS, CNS, IMA, security, space systems, and human factors are encouraged.

Areas of emphasis will include:

- » Airspace Integration of Uncrewed Vehicles
- » Flight Operational Efficiency for Reduced Climate Impact
- » Machine Learning in Practice
- » Adaptive Networks
- » Cognitive Assistants
- » Safety Assurance and Human Factors
- » Human-autonomy Teaming
- » Flight Deck of the Future
- » Security & Information Assurance
- » Single Pilot Operations
- » Trust in Automation
- » Certification



TECHNICAL PROGRAM

Air Traffic Management (ATM)

Fusion of sensor data from multiple airborne and ground systems to address ATM challenges; application of AI and machine learning to leverage distributed knowledgebase; predictive automation aids to reduce controller and pilot workload. Automation and cognitive radios to support dynamic sectors and mitigate escalating spectrum demand; traffic flow management; spacing, sequencing, and scheduling; command and control technologies for future ATM; separation management; unmanned aircraft system traffic management (UTM) inspired air traffic management for new entrants; simulation and modeling needs.

Advanced Air Mobility (AAM) & Unmanned Aircraft Systems (UAS)

Issues and challenges related to safe, accessible, automated, and affordable air transportation for passengers and cargo serving previously uneconomic urban and rural locations, including its societal integration and acceptance and the required safe and secure infrastructure; management of the airspace and of fleet operations; development of AAM vehicles; and the management of individual vehicles in an airspace shared with others. Application domains include commercial inter-city, cargo delivery, public services, and private or recreational vehicles. This track, furthermore, addresses the unmanned aircraft systems themselves and covers issues, challenges, and opportunities arising from emerging drone and autonomy technology developments; remotely piloted aircraft (RPA); certification of autonomy and machine-learning enabled components (MLEC); and UAS design, applications, and mission optimization. Of significant interest are concepts for integrating UAS into both controlled and uncontrolled airspace.

Communications, Navigation, and Surveillance and Information Networks (CNS)

Distributed knowledge base enabled by broadband communications and by on-board and ground-based CNS systems for all vehicles and services. Emerging fields such as surface wireless networks; air/ground datalinks, satellite-based CNS, optical communications, global navigation satellite systems (GNSS), alternative positioning navigation and timing (APNT), performance-based navigation (PBN), surveillance systems for ATM and collision avoidance, self-forming/healing networks, quality of service (QoS) driven software defined networks, and the roles of machine learning and AI in navigation, surveillance, and communication networks.

Cyber, Systems, and Software (CSS)

Design, testing, verification, validation, and certification of large complex aviation systems with multiple design assurance levels; avionics cyber security; cyber-physical security threat assessment and mitigation development; airborne network security and risk; software assurance versus regular security patches. Multiple Independent Levels of Security (MILS); physical and virtual system firewalls; AI-based deep packet inspection; data security for shared data buses; operating system security; virtual versus physical domain separation.

Integrated Modular Avionics (IMA)

System resources and performance allocation, configuration, integration, verification, and certification processes and tools; model-based system engineering; scalability; inter-partition interference on multicore processors; assessing system demand and resource availability; mitigation of common mode failures; system maintenance; wired and wireless communication; health monitoring; optimization techniques; architectures including open interface standards; operating systems; ARINC-653; alternate API solutions; communication standards; use of Commercial-Off-The-Shelf (COTS) technologies; modularity vs. scalability.

Human Factors (HF) & Space Systems & Special Topics

Methods and considerations to support human-autonomy teaming. Issues on human interaction with automation such as mode awareness, trust in automation, roles and responsibilities, flight deck displays and controls, decision support tools, assessment and modeling of human performance, and methods for avoiding the presentation of hazarding misleading information. Developing AI behavior that is unambiguous or predictable to human operators and demonstrating that such systems meet their intended function in all foreseeable operating conditions. This track furthermore addresses space systems and topics that do not fit the above areas or are recently emerging from new technical innovations, such as but not limited to: emerging systems architectures; safety-critical avionics; mission planning, and operations; risk management methods; and computer aided design.

SPONSORS AND EXHIBITS

This year's conference will feature exhibits and product demonstrations by representatives of key avionics-related industries and institutions. To have your organization represented in our exhibit hall, please contact our Sponsors and Exhibits Chair via the conference website.

For inquiries regarding paper submissions, please contact:

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